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Indian Standard

**SPECIFICATION FOR
BUCKETS FOR BUCKET ELEVATORS**

(Fourth Reprint OCTOBER 1997)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR

BUCKETS FOR BUCKET ELEVATORS

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Indian Standard

SPECIFICATION FOR

BUCKETS FOR BUCKET ELEVATORS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 2 February 1973, after the draft finalized by the Convoyors, Vertical Hoists and Bucket Elevators Sectional Committee had been approved by the Mechanical Engineering Division Council.

0.2 This standard lays down the requirements for buckets for spaced bucket elevators and continuous-bucket elevators. The buckets of Types A1, A2, A3 and A4 are used with spaced bucket elevators whereas Types B1, B2, B3 and B4 are used with continuous bucket elevators. The buckets of Type A1, B1, B2, B3 and B4 are fabricated from sheet metal such as steel, aluminium or stainless steel and the buckets of Types A2, A3 and A4 are cast.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard lays down the requirements for the fabricated and cast buckets for spaced bucket elevators and continuous bucket elevators, for carrying bulk material of varying characteristics.

1.1.1 This standard does not lay down requirements for fixing of buckets to belts or chains and is not applicable to buckets handling material which does not behave as a solid.

2. TERMINOLOGY

2.1 For the purpose of this standard, the terms and definitions given in IS : 4240-1967† and the following shall apply.

*Rules for rounding off numerical values (*revised*).

†Glossary of conveyor terms and definitions.

2.1.1 Bucket Capacity — The maximum amount of material (in volume or weight) that bucket can contain when filled completely.

NOTE — The actual capacity depends on the material handled, its angle of repose, loading and inclination of the elevator.

3. TYPES

3.1 The buckets shall be of the following types:

- a) Types A1, A2, A3 and A4 — These types of buckets are used in spaced bucket elevators.
- b) Types B1, B2, B3 and B4 — These types of buckets are used in continuous bucket elevators.

4. MATERIAL

4.1 Fabricated buckets shall be manufactured from suitable steel, aluminium or stainless steel sheets conforming to relevant Indian Standards. Cast buckets shall be made of malleable cast iron conforming to IS : 2107-1962* or IS : 2108-1962† or from the cast steel conforming to IS : 1030-1962‡ or aluminium or stainless steel castings. Buckets may also be made of reinforced fibreglass polyester resin or other reinforced plastics.

5. DIMENSIONS

5.1 The main dimensions for buckets for bucket elevators shall be as given in Tables 1 to 5.

6. MANUFACTURE

6.1 Types A1, B1, B2, B3 and B4 Buckets — The buckets shall be fabricated from suitable sheets and the joints shall be either pressed on or welded. In exceptional cases, the joint may be of soldered construction as well. The shape of buckets shall be as indicated in figures of Tables 1 and 5. The sharp edges shall be suitably rounded off.

6.2 Types A2, A3 and A4 Buckets — The buckets shall be cast in shapes as indicated in figures of Tables 2 to 4. The buckets of Type A2 shall be provided in any of the following forms:

Form 1 — Buckets without reinforcement of rim,

Form 2 — Buckets with reinforcement of rim on front side, and

Form 3 — Buckets with reinforcement of rim on all the three sides.

*Specification for whiteheart malleable iron castings.

†Specification for blackheart malleable iron castings.

‡Specification for steel castings for general engineering purposes (*revised*).

6.3 The fixing arrangement of buckets to the belts or chains shall be as specified in IS : 6930*.

7. DESIGNATION

7.1 The buckets shall be designated by the following:

- a) Commonly used name,
- b) Type of bucket,
- c) Form of the bucket (for Type A2 buckets only),
- d) Length and projection,
- e) Thickness (in mm for fabricated buckets only),
- f) Method of fixing, and
- g) Number of this standard.

Example 1:

A fabricated bucket of Type B2 of length 150 mm, projection 75 mm and of 2.6 mm thick sheet and having fixing arrangement 'C' according to IS : 6930* shall be designated as:

Bucket B2, 150 × 75 × 2.6 C IS : 6833

Example 2:

A cast bucket of Type A2 and of Form 1 having al engh of 150 mm and projection of 100 mm and having fixing arrangement 'C' according to IS : 6930* shall be designated as:

Bucket A2 × 1, 150 × 100 C IS : 6833

8. MARKING

8.1 The buckets shall be stamped with type of bucket, length, projection, depth, thickness in case of fabricated buckets and manufacturer's name, initial or trade-mark. Year of manufacture also shall be marked if required by the purchaser.

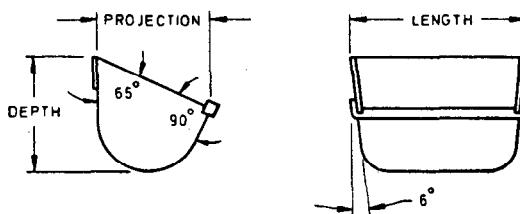
8.2 The buckets may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

*Guide for fixing arrangement of buckets for bucket elevators (*under preparation.*)

TABLE 1 DIMENSIONS FOR TYPE A1 BUCKETS
(Clauses 5.1 and 6.1)

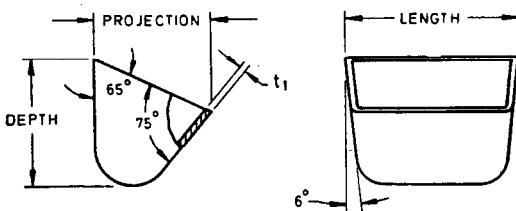
All dimensions in millimetres.



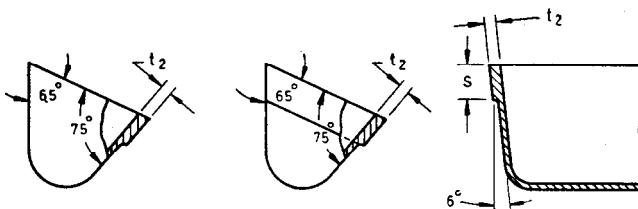
| BUCKET SIZE | | | CAPACITY IN LITRES | APPROX MASS OF STEEL BUCKETS IN kg FOR SHEET THICKNESS | | | |
|-------------|------------|-------|-----------------------|-----------------------------------------------------------|------|-------|-------|
| Length | Projection | Depth | | 1.25 | 1.6 | 2.00 | 2.5 |
| 150 | 95 | 100 | 0.87 | 0.45 | 0.60 | 0.75 | — |
| 200 | 115 | 130 | 1.67 | 0.72 | 0.96 | 1.20 | — |
| 250 | 135 | 150 | 3.06 | 1.10 | 1.45 | 1.80 | — |
| 310 | 160 | 170 | 5.18 | 1.90 | 1.90 | 2.40 | — |
| 360 | 160 | 170 | 6.10 | — | 2.20 | 2.80 | — |
| 410 | 185 | 190 | 8.26 | — | 2.90 | 3.60 | — |
| 460 | 185 | 190 | 9.40 | — | 3.20 | 4.00 | — |
| 510 | 185 | 190 | 10.50 | — | 3.50 | 4.40 | — |
| 560 | 185 | 190 | 11.20 | — | 3.80 | 4.80 | — |
| 610 | 185 | 190 | 12.50 | — | 4.10 | 5.10 | — |
| 800 | 185 | 190 | 16.20 | — | 6.20 | 6.20 | 8.00 |
| 800 | 250 | 260 | 29.00 | — | — | 9.00 | 11.70 |
| 1 000 | 250 | 260 | 36.50 | — | — | 11.00 | 14.50 |

NOTE—These buckets are used for powdered and free flowing materials.

TABLE 2 DIMENSIONS FOR TYPE A2 BUCKETS
(*Clauses 5.1 and 6.2*)
All dimensions in millimetres.



Form 1 Without Reinforcement of Rim



Form 2 With Reinforcement of Rim on Front Side

Form 3 With Reinforcement of Rim on all the Three Sides

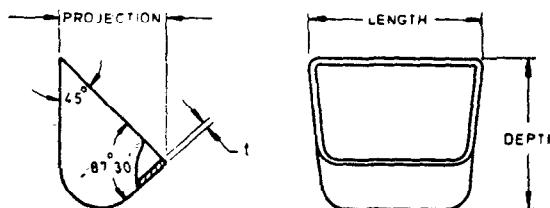
| BUCKET SIZE | | | CAPA- CITY IN LITRES | t_1 | t_2 | S | APPROX MASS OF CAST IRON BUCKETS IN kg | | |
|-------------|-----------------|-------|----------------------------|-------|-------|-----|-------------------------------------------|--------|--------|
| Length | Projec- tion | Depth | | | | | Form 1 | Form 2 | Form 3 |
| 150 | 100 | 110 | 0.85 | 4 | 7 | 30 | 1.6 | 1.71 | 1.87 |
| 200 | 130 | 140 | 1.98 | 4 | 7 | 35 | 2.6 | 2.60 | 2.96 |
| 250 | 150 | 160 | 3.4 | 4 | 7 | 40 | 3.8 | 4.04 | 4.36 |
| 310 | 180 | 190 | 5.35 | 5 | 8.5 | 50 | 6.7 | 7.13 | 7.63 |
| 360 | 180 | 190 | 6.5 | 5 | 8.5 | 50 | 7.4 | 7.90 | 8.40 |
| 410 | 200 | 215 | 9.6 | 5 | 8.5 | 60 | 9.7 | 10.39 | 11.15 |
| 460 | 200 | 215 | 11.0 | 5 | 8.5 | 60 | 10.6 | 11.37 | 12.11 |
| 510 | 200 | 215 | 12.2 | 6 | 10 | 60 | 11.5 | 12.48 | 13.33 |
| 560 | 200 | 215 | 13.7 | 6 | 10 | 60 | 12.4 | 13.48 | 14.32 |
| 610 | 200 | 215 | 14.8 | 6 | 10 | 60 | 13.3 | 14.47 | 15.32 |
| 610 | 255 | 270 | 22.5 | 6 | 10 | 70 | 20.0 | 21.37 | 22.62 |
| 800 | 255 | 270 | 29.5 | 7 | 12 | 70 | 29.0 | 31.24 | 32.81 |
| 1000 | 255 | 270 | 38.0 | 7 | 12 | 70 | 35.5 | 38.30 | 39.87 |

NOTE — These buckets are used for cement, coal, sand, gravel, stone, pulp, ores, chemicals, fertilizer and similar other material.

TABLE 3 DIMENSIONS FOR TYPE A3 BUCKETS

(Clauses 5.1 and 6.2)

All dimensions in millimetres.



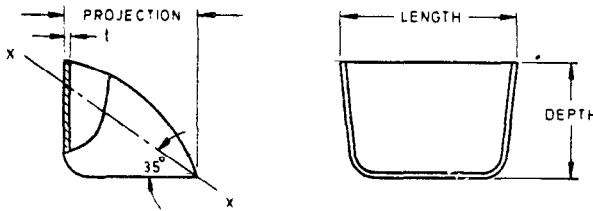
| BUCKET SIZE | | | CAPACITY IN LITRES | THICKNESS t | APPROX MASS OF CAST IRON BUCKET IN kg |
|-------------|------------|-------|--------------------|---------------|---------------------------------------|
| Length | Projection | Depth | | | |
| 150 | 90 | 130 | 0.71 | 4 | 1.35 |
| 175 | 90 | 130 | 0.85 | 4 | 1.50 |
| 200 | 90 | 130 | 1.13 | 4 | 1.70 |
| 250 | 100 | 140 | 1.70 | 5 | 2.90 |
| 310 | 140 | 190 | 3.95 | 5 | 4.85 |
| 360 | 140 | 190 | 4.60 | 5 | 5.50 |
| 410 | 165 | 230 | 6.80 | 5 | 7.85 |

NOTE — These buckets are used for wet, stringy materials likely to stick on bucket walls. It is also used for handling stones, ores and other coarsely broken materials on inclined elevators.

TABLE 4 DIMENSIONS FOR TYPE A4 BUCKETS

(*Clauses 5.1 and 6.2*)

All dimensions in millimetres.



| BUCKET SIZE | | | *CAPACITY IN LITRES | THICKNESS <i>t</i> | APPROX MASS OF CAST IRON BUCKET IN kg |
|-------------|------------|-------|------------------------|-----------------------|------------------------------------------------|
| Length | Projection | Depth | | | |
| 150 | 115 | 100 | 0.735 | 4 | 1.27 |
| 200 | 115 | 100 | 0.990 | 4 | 1.62 |
| 250 | 125 | 100 | 1.470 | 5 | 3.07 |
| 310 | 125 | 100 | 1.730 | 5 | 3.61 |
| 360 | 180 | 140 | 3.900 | 5 | 6.00 |
| 410 | 180 | 140 | 4.470 | 5 | 6.63 |

NOTE — These buckets are used for sugar, clay, salt, newly pulverized wet ores, etc., which tend to pack in the buckets.

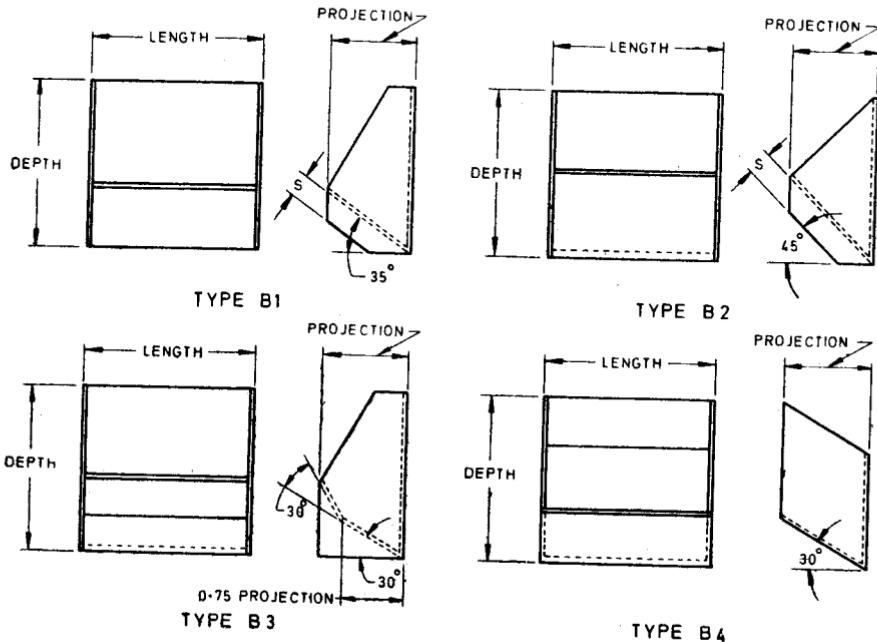
*Capacity when filled up to line *xx*.

TABLE 5 DIMENSIONS FOR TYPE B BUCKETS

(*Clauses 5.1 and 6.1*)

All dimensions in millimetres.

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| BUCKET SIZE | | | S | BUCKET CAPACITY IN LITRES | | | APPROX MASS OF STEEL BUCKETS IN kg FOR SHEET THICKNESS | | |
|-------------|------------|-------|----|-------------------------------|------------------|------------------|--------------------------------------------------------|------|------|
| Length | Projection | Depth | | Types B1 & B4 Inclination 57° | Type B2 Vertical | Type B3 Vertical | 2·6 | 3·15 | 5·00 |
| 150 | 75 | 145 | 20 | 0·81 | 0·81 | 0·93 | 1·1 | 1·3 | — |
| 200 | 125 | 195 | 25 | 2·40 | 2·40 | 2·75 | 2·5 | 3·0 | — |
| 250 | 150 | 195 | 30 | 3·65 | 3·65 | 4·18 | 3·5 | 4·5 | — |
| 250 | 180 | 310 | 35 | 6·70 | 6·70 | 7·45 | 4·5 | 5·5 | — |
| 310 | 180 | 310 | 35 | 8·3 | 8·3 | 9·9 | 5·5 | 7·0 | 10·5 |
| 310 | 200 | 310 | 40 | 9·2 | 9·2 | 10·9 | 6·0 | 7·5 | 11·5 |
| 360 | 180 | 310 | 35 | 9·5 | 9·5 | 11·4 | 6·0 | 7·5 | 11·5 |
| 360 | 200 | 310 | 40 | 10·7 | 10·7 | 12·4 | 6·5 | 8·5 | 12·5 |
| 410 | 200 | 310 | 40 | 12·2 | 12·2 | 15·4 | 7·5 | 9·5 | 14·5 |
| 460 | 200 | 310 | 40 | 13·7 | 13·7 | 17·1 | 8·0 | 10·0 | 15·5 |
| 460 | 300 | 460 | 50 | 30·5 | 30·5 | 36·2 | 12·0 | 15·0 | 23·0 |
| 510 | 250 | 310 | 45 | 19·0 | 19·0 | 24·1 | — | 11·5 | 18·0 |
| 510 | 300 | 460 | 50 | 34·0 | 34·0 | 40·3 | — | 17·0 | 26·0 |
| 610 | 250 | 310 | 45 | 22·8 | 22·8 | 28·9 | — | 13·0 | 20·0 |
| 610 | 300 | 460 | 50 | 41·0 | 41·0 | 48·6 | — | 19·0 | 29·0 |

NOTE 1 — Type B1 buckets are used for pulverized and sluggish materials that would stick or get packed in bucket and on inclined elevator.

NOTE 2 — Type B2 buckets are used for average materials for vertical elevators.

NOTE 3 — Type B3 buckets are used when extra capacity or large lumps are to be handled.

NOTE 4 — Type B4 buckets are used on inclined bucket elevator not over 70° inclination with horizontal.

BUREAU OF INDIAN STANDARDS**Headquarters:**

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002
 Telephones: 323 0131, 323 3375, 323 9402
 Fax : 91 11 3234062, 91 11 3239399, 91 11 3239382

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